VUCOM I

VUCOM I

DISPLAY TERMINAL
MAGNETIC TAPE CASSETTE RECORDER
IMPACT PRINTER
NON-IMPACT PRINTER

PREPARED BY

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INSTRUCTOR'S NOTES

GENERAL

VUcom I is a new data service composed of: Display Terminal; Magnetic Tape Cassette Recorder; Non-Impact Printer, and Impact Printer.

VUcom I service is a Trans-Canada Telephone System offering. Each system Company is responsible for all phases of a VUcom I installation in it's own territory.

DISPLAY TERMINAL - GENERAL

The VUcom I Display Terminal are [redacted]. There are two types of Terminal offerings: LIST I and LIST II. Both are ON LINE units, however, the LIST II is provided with message preparation features permitting efficient, speedy block message transmission.

MARKET APPLICATIONS

The VUcom I Display Terminal is used primarily as an input/output device associated with a central processor, or to send messages, or order information between Display Terminals, or other compatible terminals. Some application examples are as follows:

- Time-sharing
- Process control
- Management Information Systems
- Legal Services (case search, etc.)
- Retail credit check
- Library retrieval
- Order entry
- Current users of teletypewriter systems

CONFIGURATIONS

The VUcom I Display Terminal may be associated with Telephone Company or Customer owned and maintained facilities (COAM). It can be used in the following station configurations:

- Stand alone.
- [redacted]).

- Two point channel connection to the computer port or to another VUcom I Terminal at a distance greater than 50 feet in the same building or on the same continuous property (modems are necessary).

- To a computer port or to another VUcom I Terminal off premises via a two point data channel, local or inter-exchange (modems are necessary).

- [redacted]:

  - Individual Line
  - PBX Extension
  - Foreign Exchange
  - WATS
  - Multicom I
  - Dataline II

* [redacted]

INTERFACES

[redacted]rs.

The [redacted] or its equivalent is used to interface the Terminal to the switched network or data channel. The Terminal communicates [redacted] at manually adjustable transmission rates of [redacted] in the USASCII code. [redacted] On In-house arrangements data can be transmitted at speeds up to 9600 baud. The circuits operate in full or half duplex.

DISPLAY TERMINAL DESCRIPTION

The Display Terminal contains: a display module with associated drive circuits; a 640 character refresh memory with 640 character add-on capability; a control logic; a data entry keyboard; asynchronous modern interface; [redacted], and an internal power supply.

DISPLAY MODULE

The display portion of the terminal consists of a television display module which accepts composite video from the character memory and associated control logic. The basic machine displays 8 lines of 80 characters within a viewing area of 8-inches high by 10-inches wide. A character memory expansion (optional) allows the display of 16 lines of 80 characters. Display repertoire is the USASCII 1968 set of 96 displayable characters plus three characters generated from control function codes. Characters appearing on the display screen are dot formed by selectively unblanking positions within a 5 by 9 dot matrix during a normal television raster scan. Nominally, the character appears on the display 1/8 inch wide and 1/4 inch high. A cursor (entry marker) appears on the display screen as a flashing underline dash to indicate the position of the next character displayed. The display refresh rate is 60 HERTZ.

KEYBOARD

The keyboard is the main input device for the terminal. It is a functionally complete module which supplies 7-bit USASCII codes and operator control signals to the terminal's interface circuits. [redacted]

The keyboard contains a common alpha-numeric teletypewriter key layout for displayable characters and control functions, and the following added operator convenience features:

- 10-key adding machine type numeric cluster in addition to basic numeral row.
- Common teletypewriter function codes available by CNTRL + key depression.
- [redacted]

There is no mechanical or audible noise associated with the key depressions. It's an extremely quiet terminal. A light touch on the keys is all that is required to generate their respective codes. If the operator depresses a second key before the first key is released, the second key will not generate its respective code until the first key is released.

MAGNETIC TAPE CASSETTE RECORDER - GENERAL

The Magnetic Tape Cassette Recorder is an optional input/output device. The unit is versatile and economic. It is used to prepare, store and transport data efficiently.

The Recorder is a self-contained stand alone unit designed for use with the VUcom I Display Terminal or a customer owned and maintained terminal. Programs, data or messages can be prepared efficiently off-line then transmitted on-line at high speeds. It is also possible to prepare, to store, to maintain data files and search these files for particular data previously recorded. The recording medium can be used instead of a hard copy Printer in applications where records of incoming messages must be kept for certain periods. The tape cassettes easily replace the programmed punched cards.

INTERFACE

Two connectors are provided on the Recorder; one for connection to the Terminal, the other one for connection to the modem. The Terminal's interface to the switched network or data channel is associated with the Recorder. The Tape Cassette Recorder is capable of transmitting (reading) and receiving (recording) serial asynchronous data at line speeds of 110, 150 and 300 baud in full or half duplex. Data can be recorded at one speed and played back at a different speed.

DESCRIPTION

The Recorder is a magnetic storage device which uses computer certified type cassettes. The removable tape cassettes provide a reusable storage capacity of 50,000 characters. The Recorder functional modes can be manually or remotely activated, on an attendant or non-attendant basis. Edit and correction operations can be performed on selected characters at any point on tape, and at any time without destroying adjacent characters. The fact that the cassettes can be passed a thousand times makes their use economical.

NON-IMPACT PRINTER - GENERAL

The Non-Impact Printer is an optional unit which provides quiet, low cost printout capabality for the Terminal.

. The Printer is used as an output printing device associated with the Display Terminal to provide single page copy of data.

The Non-Impact Printer is specifically designed to operate with a VUcom I Display Terminal.

INTERFACE

The Display Terminal is provided with a serial Printer output channel which connects the ~~Printer~~ with the Display Terminal and its associated modem. Impression of data on the Printer (hard copy) and data displayed on the Terminal are performed simultaneously via the Printer channel, transmitted character by character, 7-bit serial USASCII. The speed of the Printer is regulated by the speed of the associated Display Terminal, ~~at rates of 75, 110, 150, 200 and 300 baud~~. Operation of the appropriate Printer control buttons on the Terminal provides either, a full screen of data printout or a character by character printout.

A Printer may be used exclusively by one Terminal or up to eight Terminals may share the use of a single Printer. In which case, the Terminals are inter-wired in a daisy chain fashion by means of two connectors located on the connector pannel at the rear of the Display Terminal. The total cable length must not exceed 1500 feet. Visual indicators are provided to indicate Printer in use.

DESCRIPTION

The Printer is a hard copy thermal device and contains a minimum number of moving parts. The printing is accomplished by thermal printing elements against heat sensitive paper, resulting in a noise free operation. To operate, the Printer need only to be turned on and loaded with paper. For convenience, external line feed, carriage return and single/double line spacing controls are provided.

IMPACT PRINTER - GENERAL

The Impact Printer is an optional receive only configuration of the DATA com 300 terminal. It is designed to operate with the Display Terminal as an output device. The Printer may be installed with or without keyboards. In the case of an installation with a keyboard, it will always be disabled. The Printer is available with line lengths of 75 and 118 print positions and accomodates friction or sprocket feed paper. The Printer equipped with a line length of 75 print positions, as compared to the associated Display Terminal standard length of 80 characters, causes overprinting on the last character position in those lines exceeding 75 characters. On the 118 line length only the first 80 print positions are used.

The Printer is used on-line with the Display Terminal to provide multi-copies of transmitted and received data, at transmission speeds of up to 300 baud. A special interface coupler enables the Display Terminal to work in conjunction with the Impact Printer.

A Printer may be used exclusively by one Terminal or up to eight Terminals may share the use of a single Printer. In which case, the Terminals are inter-wired in a daisy chain fashion by means of two connectors located on the connector panel at the rear of the Display Terminal. The total cable length must not exceed 1500 feet. Visual indicators are provided to indicate Printer in use. Refer to "DATAcom 300 Manual" for detailed description of equipment.

POWER

POWER supply should be on a separately fused circuit, with one 110 volt 60 cycle outlet for each unit in the configuration including the Display Terminal, Non-Impact Printer, Impact Printer, Magnetic Tape Cassette Recorder, and Data set.

It is the responsibility of the customer to arrange for proper wiring and a standard U-ground outlet(s) prior to the installation of service.

A power cord, approximately six feet in length, is part of each piece of VUcom I standard equipment.

PAPER, RIBBON AND TAPE

PAPER

The Non-Impact Printer is supplied with two rolls of paper, one installed in the Printer. Further supplies are a customer responsibility.

The special heat sensitive paper is available from local [redacted]s across Canada, as [redacted]. It is supplied in rolls of 100 or 430 feet. Colour selection of white or yellow should be specified when ordering.

NOTE: There might be other Companies that can furnish the "P37 Thermal Printer Paper". NCR Company is the only one we know of, at present time.

PAPER AND RIBBON

The Impact Printer is supplied with two rolls of standard business machine paper and two ribbons, one of each installed in the Printer. Further supplies are a customer responsibility.

TAPE

The Magnetic Tape Cassette Recorder is supplied with one tape cassette. Further supplies are a customer responsibility.

The computer certified cassette is recommended.

OPTIONAL FEATURES

DISPLAY EXPANSION

The Terminal is designed to accept a character memory expansion of 640 additional characters. It provides ~~16 lines of 80 characters on~~ the video display as compared with the ~~basic version of 8 lines of 80 characters~~.

[redacted]

An answer-back consisting of a maximum of 14 characters gives a remote location positive identification of the Terminal. The feature also provides an additional key labelled HERE IS, located on the upper right area of the keyboard. Depression of the HERE IS key on your Terminal or receipt of the WRU (CNTRL + E) control code, causes the transmission of your answer-back.

BLOCK TRANSFER

BLOCK MODE feature permits the operator to prepare and display information on the Display Terminal before data is transmitted. It allows for block transmission of all or part of the message stored on the Display screen as opposed to character by character transmission.

The BLOCK MODE feature permits Block Transfer of Data to Telephone Company and COAM remote terminals, Non-Impact and Impact Printers and Magnetic Tape Cassette Recorder.

Display Terminals provided with Block Transfer feature are equipped with two additional keys, BLOCK MODE and EDIT keys located above the numeric cluster.

RATES AND USOC CODES

Monthly and Service Charges

	Monthly Rate	Service charge	Switched Network	Local Channel	Inter-Exchange Channel **
(1) ~~VUcom I Display Terminal~~	~~$ 70.00~~	~~$ 25.00~~	~~3CA~~	~~3CACX~~	~~3CALX~~
(1) ~~Non-Impact Printer~~	~~95.00~~	~~25.00~~	~~3CB~~	~~3CBCX~~	~~3CBLX~~
(1) Magnetic Tape Cassette Recorder	90.00	25.00	3CC	3CCCX	3CCLX
(1) Impact Printer (Friction)	130.00	50.00	3CH	3CHCX	3CHLX
(1) Impact Printer (Sprocket)	135.00	50.00	3CJ	3CJCX	3CJLX
(1) Impact Printer Wide Platen (Sprocket)	145.00	50.00	3CK	3CKCX	3CKLX
~~Display Expansion 16 Lines~~	~~10.00~~	~~25.00 *~~	~~3CD~~	~~3CDCX~~	~~3CDLX~~
~~Block Transfer~~	~~7.00~~	~~50.00 *~~	~~3CE~~	~~3CECX~~	~~3CELX~~
~~Answerback~~	~~5.00~~	~~25.00 *~~	~~3CG~~	~~3CGCX~~	~~3CGLX~~
Impact Printer Interface	5.00	NIL	3CF	3CFCX	3CFLX

(1) A move of any of these terminals within the same premises, will be charged at half the service charge.

* Service Charge applies only when the feature is installed after the VUcom I Display Terminal Installation.

** Inter-Exchange includes Inter-Exchange EAS and Inter-Exchange Channels for this application.

NOTE 1: The standard VUcom I configuration does not permit the use of the Non-Impact and Impact Printers without the Display Terminal.

NOTE 2: When the Impact Printer is associated with the VUcom I Display Terminal the Impact Printer Interface must be installed.

NOTE 3: Use the Local Channel USOC Code when the equipment is installed on a stand alone or associated with customer provided "In-House" (same continuous property) facilities.

The above rates do not include the data set.

NOTE: These above rates are for your information only, they should not be discussed with the Customer. These rates will not be updated.

ABBREVIATIONS

ACK	Acknowledge	
BPS	Bits per second	
BS	Backspace	
CPS	Characters per Second	
CR	Carriage Return	(USASC11 Mnemonic Codes)
CTS	Clear to Send	
DC1	Device Control 1	(USASC11 Mnemonic Codes)
DC2	Device Control 2	(USASC11 Mnemonic Codes)
DC3	Device Control 3	(USASC11 Mnemonic Codes)
DC4	Device Control 4	(USASC11 Mnemonic Codes)
DLE	Data Link Escape	(USASC11 Mnemonic Codes)
DSR	Data Set Ready	
EBT	End of Transmission Block	
ENQ	Enquiry	
ESC	Escape	
ETX	End of Text	(USASC11 Mnemonic Codes)
FF	Form Feed	(USASC11 Mnemonic Codes)
FS	File Separator	
GS	Group Separator	(~ ~ ~ ~)
HT	Horizontal Tabulation	
HZ	Hertz - Cycles per second	
LF	Line Feed	
NUL	Provides timing per telecommunications requirements. Will send a break transmission with distant terminal.	
PRTR ACT	Printer Active	
PRTR BSY	Printer Busy	
S1	End Inverse Video	(USASC11 Mnemonic Codes)
SO	Start Inverse Video	(USASC11 Mnemonic Codes)

ABBREVIATIONS (cont'd)

SOH	Start of Heading	
STX	Start of Text	(USASC11 Mnemonic Codes)
US	Universal Separator	(~)
VT	Vertical Tabulation	(USASC11 Mnemonic Codes)

GLOSSARY

BAUD	A unit of signalling speed. In an equal length code, one bit corresponds to a rate of one signal element (bit) per second. Where the bits are not equal in length, the baud rate will vary somewhat.
BLOCK MODE	Permits you to compose a message and transmit as an entity - similar to short tape preparation.
CENTRAL PROCESSOR	Is the computation centre.
CIRCUIT BREAKER	Takes the place of a fuse.
COMPUTER CERTIFIED CASSETTE	- High quality tape Cassette.
CURSOR	The cursor is a flashing underline to indicate the character position on the VUcom 1 Display Screen. This is a name generally used in the data field when referring to the character indicator on Cathode Ray Tubes (CRT's).
DAISY CHAINING	A term used when several terminals are locally linked, by means of connectors, to a single printer.
DUMP PRINT	Data on screen is transferred to printer.
ELECTRONIC DATA ENTRY KEYBOARD	- Is a keyboard in which the only mechanical movement is the key itself.
ETX	End of text code (▲). Enters in the display memory and provides an indication of the end of message.
HARDWARE	Is the actual equipment.
HEAT SENSITIVE PAPER	- Used with the Non-Impact Printer, characters are formed when thermal head of printer contacts paper as compared to impact strokes of teleprinters.
INTERFACE	A circuit which converts one type of signal to another.
INVERSE VIDEO	Black characters on white background, used to highlight selected areas of display.

MEMORY CARD	A printed circuit card to be inserted in the logic rack to expand the memory from 8 to 16 lines.
MILLISECOND	One thousandth of a second. (MS)
OCTAL CODE	Is a number system using base 8 as opposed to decimal base 10.
PAGE MODE	Start position is at top left hand side of screen. Data entries move downward on display area.
SCROLL MODE	Start position is at bottom left hand side of screen. Data entries move upward on display area.
SOFTWARE	Computer programs and routines used to extend the capabilities of computers. They are not the user's application program.
THERMAL (PRINTING ELEMENTS)	Thermal printing head, used with the Non-Impact Printer.

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DISPLAY TERMINAL

LIST I AND LIST II

METHOD OF OPERATION

DESCRIPTION OF EQUIPMENT

POWER ON/OFF PROCEDURES

1. POWER	PUSHBUTTON SWITCH/INDICATOR	Provides power to the Terminal when illuminated. Sets all logic elements to initial or starting condition. Turns off power when extinguished.
2. CURSOR	FLASHING UNDERLINE	When power is on, the Data Entry CURSOR appears on the screen. Positions at the left hand side under the first character position and flashes approximately four times a second. Moves one character position to the right when a character key is depressed.
3. BRIGHTNESS	ROTARY SWITCH	Located at the lower right hand side of the screen. Used to adjust video intensity display. Control can be set so displayed data can be easily seen. Data appears out of focus when display is too bright and the life of the display tube may be shortened.
4. KEYLOCK	KEY-OPERATED LOCK-SWITCH	Is used to manually disable the keyboard. To lock out the keyboard turn KEYLOCK to the right. Data can still be received.
5. KEYLOCK INDICATOR	INDICATOR LIGHT (RED)	Located directly above the KEYLOCK switch. Indicator illuminates when the keyboard is disabled.

OPERATING MODE SELECTIONS

1. LOCAL	PUSHBUTTON SWITCH/INDICATOR	Provides two operating modes: OFF LINE and ON LINE. OFF LINE Pushbutton is illuminated. This mode is primarily for Test purposes but can be used for local operation e.g. practice Data can be received but not transmitted. ON LINE Pushbutton is extinguished. In this mode data can be received and transmitted.

2.	SCROLL DISABLE (LIST I) PAGE MODE (LIST II)	PUSHBUTTON SWITCH/INDICATOR	Allows two display format mode selections: SCROLL and PAGE mode. In SCROLL mode display, when button is extinguished. Start or home location of CURSOR is bottom left hand side of screen. New data entries are displayed on the bottom line and move up until 8 lines (or 16 line option) are displayed. Top line of data automatically disappears or rolls over the top when CURSOR returns on the 9th or 17th line. In PAGE mode display, when button is illuminated. Start or home location of CURSOR is top left hand side of screen. 8 lines (or 16 line option) are displayed starting from top of screen. When last line is reached, CURSOR returns to home location.
3.	PRINTER ON LINE (LIST I) PRINTER REQUEST (LIST II)	PUSHBUTTON SWITCH/INDICATOR	When depressed lamp lights and places PRINTER ON LINE. Page copy is automatically printed as characters are displayed on the screen.

KEYBOARD - LIST I

Keyboard arrangement is similar to regular teletypewriter. In addition to the displayable character keys (black keys) there are control function keys (blue and red keys). An added cluster of ten numeric keys is provided on the right side.

BLACK KEYS	- Alpha and symbols are both upper and lower case. Numerals are lower case only.
SHIFT LOCK	- Locking key - when depressed locks the keyboard in the upper case position. To release - depress adjacent SHIFT key.
RUB OUT	- May have varied programmed usage or may appear on the screen to indicate a parity error depending upon specific Customer's software. RUB OUTS will not erase or correct transmitted information. RUB OUT code may or may not be displayed as required.
NUMERIC CLUSTER	- Ten numeric keys. Located on right hand side of keyboard. Addition to basic numeral row. Operates in both lower and upper case position.

NOTE: The underline key may be used to send a delete code depending on specific Customer's software. Does not function as an underline key.

KEYBOARD - LIST II

Keyboard arrangement is similar to regular teletypewriter. In addition to the displayable character keys (black keys) there are control function keys (blue and red keys). An added cluster of eleven keys (10 numerals, 1 symbol) on the right side.

BLACK KEYS - Alpha and symbols are both upper and lower case. Numerals are lower case only.

SHIFT LOCK - Locking key - when depressed locks the keyboard in the upper case position. To release - depress adjacent SHIFT key.

RUB OUT - May have varied programmed usage or may appear on the screen to indicate a parity error depending upon specific Customer's software.
RUB OUTS will not erase or correct transmitted information.
RUB OUT code may or may not be displayed as required.

NUMERIC CLUSTER - Eleven keys (10 numerals, 1 symbol).
Located on right hand side of keyboard. Addition to basic numeral row. Operates in both lower and upper case position.

YELLOW SYMBOLS - Do not appear when "upper case switch mode" is set. Refer to "CONNECTOR PANEL SWITCHES" 96/64 (Character Switch).

NOTE: The underline key may be used to send a delete code depending on specific Customer's software - Does not function as an underline key.

SPECIAL CONTROL FUNCTION KEYS (RED)

CLEAR KEY	- Removes all displayed data from the screen. CURSOR positions at home location. If the Terminal is in SCROLL format mode, the CURSOR resets to the first character position of the last line. If the Terminal is in PAGE mode, the CURSOR resets to the first character position of the top line.
LINE CLEAR KEY	- LINE CLEAR key operates when the Terminal is in PAGE mode only. Removes displayed data from the CURSOR position to the end of the line. The CURSOR does not move and only the line with the CURSOR is affected.
STX KEY	- Start transmission code - Used in conjunction with the BLOCK MODE. Refer to "OPTIONAL FEATURES" for BLOCK MODE.
ETX KEY	- End of text code - Displays a character.(▲) Marks the end of text of multiple messages.

CONTROL FUNCTION KEYS USED WITH "BLUE" CNTRL KEY

X OFF (CNTRL + S)	- Stop code used for tape only. Stops the tape when in PLAY mode. Refer to "MAGNETIC TAPE CASSETTE RECORDER" (options).
EOT (CNTRL + D)	- End of Transmission code. May be used depending upon specific Customer's software.
BELL (CNTRL + G)	- Alerts a remote terminal by transmitting an audible BELL tone.
WRU (CNTRL + E)	- To receive remote Answer-back code. Refer to "OPTIONAL FEATURES" for HERE IS.
TAPE (CNTRL + R)	- Places Magnetic Tape Cassette Recorder in RECORD mode. Refer to "Magnetic Tape Cassette Recorder" (options).
~~TAPE~~ (CNTRL + T)	- Terminates RECORD mode. Refer to "MAGNETIC TAPE CASSETTE RECORDER" (options).
RU-VT-FORM	- Non-operative teletypewriter function codes.

SPECIAL CONTROL FUNCTION KEYS (BLUE)

REPEAT KEY	- Used in conjunction with any key. Repeats at approximately 12 times per second when held depressed.
RETURN KEY	- Returns the CURSOR to the first character position of the line regardless of the format mode without affecting the data.
RESET KEY	- Depressing the RESET key does not affect data. CURSOR resets to the first character position at top or bottom line depending on the format mode.
BACKSPACE (←) KEY	- Moves the CURSOR back one character position without affecting displayed data. If the CURSOR is in the first character of a line when the key is depressed, it automatically moves to the last character position in the preceding line. If the CURSOR is in the first character position of the top line, it moves to the last character in the bottom line.
SKIP (→) KEY	- Advances the CURSOR one character position without affecting displayed data. If the CURSOR is in the last character position of the bottom line and SCROLL mode is active, all data moves up one line position, the top line disappears and the CURSOR moves to the first character position in the new blank bottom line. When the CURSOR is in the last character position of the bottom line and the PAGE mode is active, the CURSOR moves to the first character position in the top line.
UP (↑) KEY	- Moves the CURSOR up one line to the same relative position without affecting displayed data. If the CURSOR is in the top line when the key is depressed, the CURSOR moves to the same relative position in the bottom line.
DOWN (↓) KEY	- (LINE FEED) Moves the CURSOR down one line to the same relative position. If the key is used when the CURSOR is in the bottom line and SCROLL mode is active, all data moves up one line, the top line disappears and the CURSOR returns to the first character position in the new last line. When the CURSOR is in the bottom line and PAGE mode is active, the CURSOR moves to the same relative character position in the top line. This operation provides a "RETURN" and "LINE FEED" when the Terminal is in SCROLL mode.

SPECIAL CONTROL FUNCTION KEYS (BLUE)

ESCAPE	- May be used depending upon specific Customer's software.
BREAK	- Displays two error symbols (▮▮). May be used depending upon specific Customer's software.
FS	- File Separator. Moves tape "off leader" or records a gap between files - (see options Magnetic Tape Cassette Recorder).
GS	- Group Separator - Used depending upon specific Customer's software.
RS	- Rewinds tape to leader. (see options Magnetic Tape Cassette Recorder).
US	- Universal Separator. Used depending upon specific Customer's software.
PRINT	- This key is for use with the optional NON-IMPACT PRINTER. Refer to "NON-IMPACT PRINTER" booklet.
BLOCK MODE	- Locking key - Used to prepare message before transmission (see options BLOCK MODE).
EDIT	- Locking key - Displays control codes inserted in message. (see options BLOCK MODE).
HERE IS	- Answer-back code - (optional).

DATA SET AND PRINTER MODE CONTROL

DSR	INDICATOR LIGHT	(Data Set Ready) Located on the panel below the Display. Illuminates when the modem associated with the Terminal is ready to transmit and receive.
CTS	INDICATOR LIGHT	(Clear to Send) Illuminates when the connection with remote terminal is established and is in operating condition to transmit data.
PRTR BSY	INDICATOR LIGHT	(Printer Busy) Illuminates when the Printer is in use by either your Terminal or another terminal sharing the same Printer. 8 terminals may share the same NON-IMPACT PRINTER. (Refer to IMPACT AND NON-IMPACT PRINTERS-options).
PRTR ACT	INDICATOR LIGHT	(Printer Active) Illuminates when your Terminal is transferring data to the Printer. (Refer to IMPACT AND NON-IMPACT PRINTER - options).

CONNECTOR PANEL SWITCHES

DISPLAY TERMINAL - LIST I

DUPLEX, PARITY and BAUD RATE switches are located on the connector panel at the back of your Terminal. These switches are normally preset for your particular Terminal.

Improper setting will result in faulty communications between your Terminal and remote equipment. In addition to these switches, there is a CIRCUIT BREAKER switch (listed below).

DUPLEX	SLIDE SWITCH	The switch has two positions: FULL and HALF DUPLEX. FULL DUPLEX position: You can transmit data without displaying characters on your screen (unless central processor returns codes to your Terminal "ECHOPLEX"). HALF DUPLEX position: Data being transmitted is displayed on your screen.
PARITY	SLIDE SWITCH	The switch has three positions: EVEN, MARK (no parity) or ODD. EVEN: Data transmitted with even parity and checked for even parity. ODD : Data transmitted with odd parity and checked for odd parity. MARK: Parity disregarded. The proper setting of this switch depends upon the Customer's specific software.
BAUD RATE	ROTARY SWITCH	The switch has five positions: 75 to 300 BAUD RATE. Turn switch to appropriate speed of transmission to allow terminal compatibility.
CBI (CIRCUIT BREAKER)	PUSHBUTTON	Depress red pushbutton switch to reset the internal circuit breaker if it has opened due to electrical overload.

CONNECTOR PANEL SWITCHES

[redacted]

DUPLEX, PARITY and BAUD RATE switches are located on the connector panel at the back of your Terminal.

These switches are normally preset for your particular Terminal.

Improper setting will result in faulty communications between your Terminal and remote equipment. In addition to these switches, there is a CIRCUIT BREAKER switch and a CHARACTER switch (both listed below).

DUPLEX	SLIDE SWITCH	The switch has two positions: FULL and HALF DUPLEX. FULL DUPLEX position: You can transmit data without displaying characters on your screen (unless central processor returns codes to your Terminal "ECHOPLEX"). HALF DUPLEX position: Data being transmitted is displayed on the screen.
PARITY	SLIDE SWITCH	The switch has three positions: EVEN, MARK (no parity) or ODD. EVEN: Data transmitted with even parity and checked for even parity. ODD : Data transmitted with odd parity and checked for odd parity. MARK: Parity disregarded. The proper setting of this switch depends upon the specific Customer's software.
BAUD RATE	ROTARY SWITCH	The switch has eleven positions: from 75 to 9600 BAUD RATE. Turn switch to appropriate speed of transmission to allow terminal compatibility.
CBI (CIRCUIT BREAKER)	PUSHBUTTON	Depress red pushbutton switch to reset the internal circuit breaker if it has opened due to electrical overload.

96/64 (CHARACTER)	SLIDE SWITCH	This two position switch specifies the number of characters available on your keyboard. Switch set to 96: all "96" displayable characters are available from your keyboard. Switch set to 64: only "64" displayable characters are available from your keyboard. Letters will display only in CAPITAL letters and the 5 yellow symbols will not display.

INVERSE VIDEO

A specific coding allows for inversion of video (generating black characters on a white back ground) to emphasize selected areas of a displayed message as no underlining is possible.

There are no limitations as to the location or number of inverse video areas. The total area may also be inverted.

Inverse video can be generated from the keyboard, or received from remote terminal.

START INVERSE VIDEO (CNTRL + N)	- Start inverse video by depressing the CNTRL key in conjunction with the "N" key.
END INVERSE VIDEO (CNTRL + O)	- End inverse video by depressing the CNTRL key in conjunction with the "O" key.
	- Inverse video fields are bracketed on the display with the start inverse video symbol (❮) and the end inverse video symbol (❯).

MESSAGE TRANSMISSION VIA SWITCHED NETWORK

ORIGINATING A CALL

To call a remote terminal, follow the operating procedures for your modem.

MESSAGE TRANSMITTED IN PAGE MODE

1. Depress POWER button, button illuminates.
2. Place Terminal in PAGE MODE selection by depressing SCROLL DISABLE or PAGE MODE button, button illuminates.
3. CURSOR positions to the top left-hand side of the screen.
4. Establish connection to remote terminal.
5. Start typing, data appears on screen and is being transmitted at the same time.
6. Depress RETURN and LINE FEED keys or continue typing until reaching the end of line (80 characters to a line).
7. An audible tone sounds upon reaching the 73rd character of a line to indicate the proximity of the end of line. CURSOR returns and line feeds automatically at the end of line.
8. At end of the last line, additional input moves the CURSOR to the first position of the top line.
9. Depress LINE CLEAR key before starting new line entries, otherwise characters appear over existing data.
10. Transmission can be terminated manually or by sending an End of Transmission code.

MESSAGE TRANSMITTED IN SCROLL MODE

PAGE MODE or SCROLL DISABLE button is extinguished. Data entries always appear on bottom line, moving up each line until screen is filled, then top line disappears.

LINE CLEAR key cannot be used in this mode.

RECEIVING A CALL

Your Terminal is set to receive data by following the operating procedure for your modem.

1. Data automatically displays on your screen.
2. Format in which data appears depends upon your Terminal format mode setting.
3. Remote terminal terminates transmission.

MESSAGE TRANSMISSION ON PRIVATE LINE

ORIGINATING OR RECEIVING A MESSAGE ON PRIVATE LINE

Private Line Terminal to Private Line Terminal. Both Terminals are always on line ready to transmit or receive messages.

1. Power is on, POWER button is illuminated.
2. Transmission takes place as soon as character keys are depressed.
3. SCROLL or PAGE mode may be used. (Mode settings should be determined before transmitting).
4. If it is necessary to alert remote terminal, depress CNTRL + BELL key.
5. Type END to indicate end of message.
6. Depress CLEAR key. Data will disappear on both Terminals.

MESSAGE TRANSMISSION

DISPLAY TERMINAL ASSOCIATED WITH NON-IMPACT PRINTER

Page copy is required while transmitting or receiving a message.

Page copy is required after message has been received.

Refer to "NON-IMPACT PRINTER" section.

DISPLAY TERMINAL ASSOCIATED WITH IMPACT PRINTER

Page copy is required while transmitting or receiving a message.

Page copy is required after message has been prepared or received.

Refer to "IMPACT PRINTER" section.

DISPLAY TERMINAL ASSOCIATED WITH MAGNETIC TAPE CASSETTE RECORDER

How to record and playback from associated terminal.

How to record and playback from remote terminal.

Refer to "MAGNETIC TAPE CASSETTE RECORDER" section.

OPTIONAL FEATURES

BLOCK MODE

This feature permits the Attendant to prepare and display information on the Terminal and then transmit all or part of the message stored on the display screen to a remote terminal as opposed to character by character transmission.

Errors made during message preparation are easily corrected. ON-LINE message transmission is at maximum speed of the system.

There are three keys associated with the BLOCK MODE feature.

BLOCK MODE	A blue locking key, located just above the numeric cluster. When depressed the Terminal will operate in BLOCK MODE.
EDIT	A blue locking key adjacent to the BLOCK MODE key is used in conjunction with BLOCK MODE. When depressed, all control function codes used in message preparation appear as their flashing character identifiers.
STX	A red non-locking key, used to transmit the prepared message when in BLOCK MODE.

Control function codes are used in message preparation and then transmitted on-line, as part of that message, to the receiving terminal. These control codes are displayed on the screen as flashing character identifiers in one of two ways.

1. Depress EDIT key to the locking position. The character identifiers continually flash while the EDIT key is locked in this position.
2. Depress the blue non-locking CNTRL button. The character identifiers flash only during the time interval that the CNTRL button is held depressed.

MESSAGE PREPARATION

BLOCK MODE

1. BLOCK MODE should be used in conjunction with PAGE MODE only.
2. A maximum of 8 lines or (16 lines option) can be transmitted at any one time.
3. When BLOCK MODE button is depressed the Terminal is off-line, there is no need to depress the LOCAL button.

   When connected to another terminal the displayed data will not be transmitted unless the STX button is depressed.
4. All the function codes that the receiving terminal is to act upon, (e.g. RETURN LINE FEED and End of Transmission) must be inserted in the message as control function codes. (See CONTROL FUNCTION CHART)
5. Line data entries are reduced to 78 characters per line, due to control function codes using two character spaces.

PREPARING A MESSAGE

1. Establish connection with distant terminal.
2. Depress PAGE MODE button - button illuminates
3. Depress BLOCK MODE and EDIT buttons to locking positions.
   EDIT button is depressed only if desired to have the function codes flash continually.
4. Depress RESET key. CURSOR appears at top left hand side of the screen.
5. Message preparation may now begin.
6. At the end of each line, depress CNTRL + RETURN and CNTRL + LINE FEED. (A flashing "M" and "J" appear on the screen). RETURN and LINE FEED codes are now inserted in the message.
7. Depress RETURN and LINE FEED without using the CNTRL button to locally return the CURSOR.
8. At the end of message preparation insert CNTRL + D. (End of Transmission code).
9. Depress RESET key to return CURSOR at home location. (Beginning of message).

CORRECTING A MESSAGE DURING PREPARATION

If an error is recognized during preparation, simply re-locate CURSOR to that position and type correct character.

MESSAGE TRANSMISSION

BLOCK MODE

1. Depress STX button to start transmission.
2. CURSOR moves rapidly across the screen as data is being transmitted.
3. If CNTRL + D has been inserted at the end of message, data transmission ceases at this point, and line disconnect occurs, depending on specific computer software.

OPTIONAL FEATURES

VUcom I DISPLAY TERMINAL TO NON-IMPACT PRINTER

Two printer control buttons and lamp indicators are located on the Display Terminal to control the Non-Impact Printer.

PRINTER ON LINE LIST 1 PRINTER REQUEST LIST 11	PUSHBUTTON SWITCH/INDICATOR	A non-locking - button when depressed, illuminates. When data is being transmitted or received in an on-line or local condition, the Printer will print all data appearing on Terminal Display.
PRINT	NON-LOCKING BUTTON	Used to transfer data appearing on the Terminal Display to the Printer. May be operated on-line or locally. The PRINT key should not be depressed while data is in the process of being transmitted or received.
PRTR BSY	INDICATOR LIGHT	The PRINTER BUSY (red) lamp illuminates when the Printer is in use by your Terminal, or another terminal sharing the same Printer.
PRTR ACT	INDICATOR LIGHT	The PRINTER ACTIVE (red) lamp illuminates when the PRINT or PRINTER REQUEST/ON-LINE button is depressed, to indicate your Terminal is in control of the Printer at that time and is transmitting data.

VUcom I DISPLAY TERMINAL TO IMPACT PRINTER

PRINTER ON-LINE/PRINTER REQUEST and lamp indicators are operative as above -

PRINT key cannot be used as the Printer does not react to the RETURN AND LINE FEED functions of the Display Terminal.

If BLOCK MODE is activated on the Terminal, the necessary control function codes (RETURN and LINE FEED) can be inserted and data can be transmitted using the PRINTER ON-LINE/PRINTER REQUEST feature.

EQUIPMENT CARE

Care should be taken not to put finger marks on the display screen.

If it is necessary to clean the display screen use a clean, soft, damp, lint free cloth. (Any grit on the cloth will scratch the screen).

REPORTING TROUBLE

1. If the display terminal is not functioning properly - check the following:

    a. Power cord connections
    b. Mode selections and status indicators
    c. Printer connectors (if used)
    d. Did you perform all of your particular site operator functions correctly?
    e. Circuit breaker
    f. Modem connector
    g. Did you dial station correctly? (if applicable)

2. Nothing appears on display screen.

    a. Depress POWER button - (it should light)
    b. POWER button illuminates, check to see if brightness control knob is not turned down too far
    c. POWER button does not light - verify power cord is plugged into electrical outlet
    d. Power cord is plugged in - Push the RED CIRCUIT BREAKER button on the connector panel at back of the Terminal
    e. Problem still exists - REFER TO YOUR SUPERVISOR

3. Data appears on display screen but control of the display is disoriented.

    a. Depress POWER button to turn power off, wait 30 seconds - depress POWER button to turn power on - It may be necessary to repeat this step several times.
    b. Problem still exists, REFER TO YOUR SUPERVISOR

REPORTING TROUBLE (cont'd)

4. Should the Supervisor not be able to clear the problem, report the trouble to the Telephone Company repair number shown on the Terminal in the following order:

    1. Type of service (VUcom I DISPLAY TERMINAL)
    2. Circuit number
    3. Company name, contact name, address and telephone number
    4. Trouble encountered
    5. Name of party reporting trouble

NOTE 1: The BAUD, DUPLEX and PARITY switches should be checked for compatibility with the remote terminal.

NOTE 2: Repair may replace a LIST 1 keyboard for a LIST 11 keyboard. Optional features are disabled.

NOTE 3: The Attendant may have trouble to adjust to the feel of the keyboard in the beginning. It is not necessary to fully depress the keys to generate their respective codes. If the Attendant depresses a second key before the first one is released, the second key will not generate its respective code until the first key is released.

CONTROL FUNCTION REPERTOIRE

Mnemonic	Octal Code	Keyboard Operation
NUL	000	CNTRL + @
SOH	001	A
STX	002	B or STX
• ETX ◆	003	C or ETX
* EOT	004	D
ENQ	005	E
ACK	006	F
BELL	007	G
*• BS	010	H or ←
HT	011	I
• LF	012	J or ↓
VT	013	K
FF	014	L
• CR	015	M or RETURN
• SO ◆	016	N
• SI ◆	017	O
DLE	020	P
* DC1	021	Q
* DC2	022	R
* DC3	023	S
* DC4	024	T
• Skip	025	U or →
• Line Clear	026	V or LINE CLEAR
EBT	027	W
• Clear	030	X or CLEAR
• Reset	031	Y or RESET
• Cursor Up	032	Z or ↑
ESC	033	[or ESCAPE
* FS	034	\ or FS
GS	035	] or GS
* RS	036	^ or RS
US	037	CNTRL + _ or US

• Causes a display operation, all other control functions are ignored by the display.

◆ Causes displayable character.

* These control functions are used with the optional Magnetic Tape Cassette Recorder unit.

VUcom I

MAGNETIC TAPE CASSETTE RECORDER

METHOD OF OPERATION

DESCRIPTION OF EQUIPMENT

POWER	SWITCH	The POWER ON/OFF 2-position switch is located on the rear of the Recorder and is used to control main power supply.
STANDBY	ILLUMINATED PUSHBUTTON	The STANDBY button, when momentarily depressed, illuminates, and places the Recorder in an idle condition. In this mode reading and recording does not take place, however, the tape may be moved by depressing REWIND, FAST FORWARD (F) or FAST REVERSE (R). If the Recorder is associated with a VUcom I Display Terminal the STANDBY mode may be activated from the Terminal keyboard.
PLAY	ILLUMINATED PUSHBUTTON	The PLAY button, when momentarily depressed, illuminates, and conditions the Recorder to read the tape and transmit the data, character by character at a rate of 110, 150 or 300 bauds. (Data need not be read at the speed it was recorded). Data originating from Terminal keyboard is ignored by the Recorder and/or modem when in PLAY mode. If the Recorder is associated with a VUcom I Display Terminal the PLAY mode may be activated from the Terminal keyboard.
RECORD	ILLUMINATED PUSHBUTTON	The RECORD button, when momentarily depressed, illuminates, and places the Recorder in a mode to write data, character by character, on the tape at a speed of 110, 150 or 300 bauds. If the Recorder is associated with a VUcom I Display Terminal the RECORD mode may be activated from the Terminal keyboard.

BACKSPACE	ILLUMINATED PUSHBUTTON	The BACKSPACE button may be operated in the STANDBY or RECORD mode. When momentarily depressed the tape will backspace one character. If this button is depressed at a point where no data has been recorded, the tape automatically backspaces until a character is read. In the RECORD mode the tape backspace without erasing data. This button does not function in the PLAY mode.
SPACE	ILLUMINATED PUSHBUTTON	The SPACE button may be operated in the STANDBY or RECORD mode. When momentarily depressed the tape advances one character. In the STANDBY mode this character will be transmitted to the terminal and/or dataset. If the SPACE button is depressed at a point where no data has been recorded, the tape automatically advances until a character is read. In the RECORD mode the tape advances without erasing data. This button does not function in the PLAY mode.
REWIND	ILLUMINATED PUSHBUTTON	The REWIND button, when momentarily depressed, illuminates, and places the Recorder in the STANDBY mode. The tape automatically rewinds until the tape leader is reached and the red LEADER LAMP lights. If initiating a rewind from the end of tape, depress button until the red LEADER LAMP extinguishes. The time span for a complete rewind is approximately 50 seconds. If the Recorder is associated with a VUcom I Display Terminal a tape rewind may be activated from the terminal keyboard.

FAST FORWARD/ REVERSE	NON-LOCKING SWITCH	The tape advances at a high speed of 400CPS while the switch is held depressed in the (F) FORWARD position. The tape reverses at a speed of 100CPS while the switch is held depressed in the (R) REVERSE position. FAST FORWARD may be used in the RECORD mode to erase data and provide File Separators between files. If the FAST FORWARD switch is depressed while in PLAY mode the Recorder automatically reverts to STANDBY. Operation of the FAST REVERSE switch automatically places the Recorder in STANDBY.
LOCAL/LINE/LNP	LOCKING SWITCH	This is a black, 3-position locking switch. When depressed in the LOCAL position the Recorder is connected to the Terminal and both units are disconnected from the dataset. This mode allows for local reading and recording. Data cannot be received from or transmitted to another terminal. In LOCAL mode the associated terminal prints in HALF or FULL DUPLEX. The LINE position is activated by operating the switch to the centre position. In this mode the Terminal is connected to the dataset via the Recorder and both may be operated on-line. In FULL DUPLEX the Recorder can transmit to, and record from the line. The local Terminal is ignored unless data is "echoed back" from the central processor. The LNP (Line Non-Print) provides on-line operation without Terminal Display. This mode is generally used when the transmission speed of the Recorder exceeds the capability of the local Terminal.

LEADER	RED LAMP	The red LEADER LAMP illuminates when tape is positioned at clear leader (beginning and end of tape).
DATA	AMBER LAMP	The amber DATA LAMP will illuminate when data is being read from, or, recorded on the tape. This lamp provides a method of locating different programs recorded on the tape, if, they have originally been recorded with File Separators between them.
MOTION	GREEN LAMP	The MOTION LAMP is green and illuminates to indicate tape movement.
RATE SWITCH		The BAUD RATE switch has three positions and should be set for compatibility with the associated terminal. Position "10" represents 110 baud Position "15" represents 150 baud Position "30" represents 300 baud
RECORD SWITCH		The RECORD switch has three positions. REM (Remote) position - The RECORD mode may be activated remotely from a terminal by means of control codes, or by manual depression of buttons on the Recorder. MAN (Manual) position - The RECORD mode can only be activated manually from the Recorder. OFF position - The RECORD mode will not function either manually or remotely.

CODE SWITCH

This is a 3-position switch used for remote Recorder operation.

CODE 1 - In this position the following control codes are originated from the terminal or transmission link to activate certain Recorder functions: -

FUNCTION	CONTROL CODE
PLAY MODE - ON	CNTRL + Q
PLAY MODE - OFF	CNTRL + S[1]
PLAY MODE - OFF (EOT)	CNTRL + D[2]
RECORD MODE - ON	CNTRL + R
RECORD MODE - OFF	CNTRL + T
BACKSPACE	CNTRL + H
REWIND	RS
FILE SEPARATOR	FS

[1] This code is sensed by the Recorder only when recorded on tape. The Recorder reverts to STANDBY.

[2] This code is sensed by the Recorder when recorded on tape. The Recorder reverts to STANDBY and the line connection is usually terminated, depending on the computer software.

CODE 2 - In this position the above functions may be remotely activated with the exception of PLAY Mode - ON (CNTRL + Q).

CODE 3 - In this position remote control codes will not activate the Recorder with the exception of CNTRL + R and CNTRL + T.

> N.B. The CODE switch should be used in conjunction with the RECORD switch.
>
> If any of these codes have been de-activated they may be recorded on tape.

DUPLEX SWITCH	This is a 2-position switch that may be operated to provide FULL or HALF DUPLEX service.
DELAY SWITCH	This is a 2-position switch. ON position - The Recorder automatically pauses for 200 milliseconds after transmitting a CARRIAGE RETURN or LINE FEED code. This allows the Terminal printer time to complete these functions. OFF position - Delay does not occur in this position.
CASSETTE TOUCH COVER	The TOUCH COVER is hinged at the bottom to the Recorder and is depressed to open for insertion or removal of the tape casette.
FILE PROTECTION TAB	There is a FILE PROTECTION TAB on the top left hand side of the cassette. The RECORD mode will not function if this tab is missing.
TAPE STORAGE CAPACITY	Provides a reusable storage capacity of 50,000 characters with 300 ft. tape cassette.
TAPE LEADER	At the beginning and end of tape there is a clear leader. Approximately 15 seconds should be allowed to reach recorded data from this leader, when in PLAY mode.

TAPE MESSAGE PREPARATION

CASSETTE INSERTION

1. Place LOCAL/LINE/LNP switch in the LOCAL position to prevent line interruption.
2. Depress bottom of TOUCH COVER cassette holder to open.
3. Insert tape cassette with tape openings facing downward and correct side of cassette facing out.
4. Depress inward on the top of TOUCH COVER until the cover latches.

CASSETTE REMOVAL

1. Place LOCAL/LINE/LNP switch in the LOCAL position.
2. Make sure that the tape is rewound and LEADER LAMP is illuminated.
3. Depress bottom of TOUCH COVER to open holder.
4. Remove cassette by lifting out of holder.

N.B. Cassette should never be removed while MOTION lamp is illuminated.

Correct side of tape should be marked before initial use of cassette.

CARE AND HANDLING OF TAPE CASSETTE

1. Cassette should be protected by an approved storage or carrying case when it is not mounted in the Recorder.
2. Cassette should never be carried in a shirt or coat pocket even when it is in a carrying case.
3. Computer grade certified cassettes ONLY should be used (with clear leaders).
4. Break in a new cassette by depressing FAST FORWARD and run tape through two or three times. This removes loose oxide particles and polishes the tape.
5. Recording on the first and last foot of tape should be avoided as they are most subject to wear.
6. The tape should be discarded after approximately 1000 passes or when permanent errors begin to appear.

HOW TO RECORD (MANUAL OPERATION)

1. Place LOCAL/LINE/LNP switch in LOCAL to prevent line interruption.
2. Make sure the cassette is correctly inserted in holder and TOUCH COVER is closed.
3. Operate RATE, DUPLEX, RECORD and CODE switches to the desired positions.
4. If LEADER lamp is illuminated, depress FAST FORWARD switch for approximately two seconds, or until LEADER lamp extinguishes.
5. Depress RECORD button - button illuminates. Recording may begin.
6. The DATA and MOTION lamps illuminate whenever data is being recorded.
7. File Separators may be inserted between files by depressing FAST FORWARD for approximately two seconds.
8. Automatic termination of tape transmission occurs in PLAY mode if CNTRL + S is recorded on tape.

TERMINATION OF RECORD MODE

1. Depress STANDBY, REWIND or FAST REVERSE buttons.
2. The STANDBY lamp illuminates.

NOTE: When Recorder is connected to a Display Terminal, HALF DUPLEX mode must be used to display characters on the Terminal.

TO ERASE THE TAPE (MANUAL OPERATION)

The entire or sections of the tape may be erased by depressing FAST FORWARD while in the RECORD mode.

Over-typing while in the RECORD mode also erases previous character(s).

TAPE EDITING

If additional characters are to be added to a tape, non-active characters must be inserted at the time of the original recording.

TO CORRECT TAPE WHILE RECORDING (MANUAL OPERATION)

ERROR RECOGNIZED IMMEDIATELY

1. Depress BACKSPACE button on Recorder, or CNTRL + H on Terminal keyboard to reverse the tape one character at a time until first character of word that error occured in, is reached.

   (CNTRL + H provides a visible indication on Terminal Display unit of exact character position.)

2. Re-type complete word that error occured in.

ERROR NOT RECOGNIZED IMMEDIATELY (MANUAL OPERATION)

If error is too far back in tape to use the BACKSPACE button, or if error is not recognized until completion of recording, the following procedure should be followed.

1. Use the FAST REVERSE, FAST FORWARD and SPACE buttons to reach the desired position.

   When the SPACE button is depressed in STANDBY mode a character is read and transmitted to the Terminal Display unit. This provides an indication of character position reached.

2. Depress RECORD button and insert correct character.

TO CONDITION RECORDER TO BE REMOTELY ACTIVATED

1. Set POWER switch to ON position.
2. Ensure that sufficient spare tape is available on cassette for recording, or that tape is set at beginning of correct file for playback.
3. Place RECORD switch to REM position.
4. Place CODE switch to CODE 1 position.
5. Set LOCAL/LINE/LNP switch to LINE position.
6. Observe that the STANDBY button is illuminated.
7. Set RATE and DUPLEX switches to desired positions.

HOW TO RECORD (FROM ASSOCIATED OR REMOTE TERMINAL)

1. If recording is started at the beginning of tape, depress blue RS button momentarily. The tape automatically rewinds.

   Wait approximately one minute for tape to rewind, or until LEADER lamp lights on Recorder.

2. Depress CNTRL + R to place Recorder in RECORD mode.
3. Depress FS button to take tape off tape leader if REWIND button has been operated. Wait 6 seconds before recording.

   This button is also used to record a File Separator (gap) between files.

4. CNTRL + S can also be inserted while in RECORD mode to provide an end-of-file code.

TERMINATION OF RECORD MODE (FROM ASSOCIATED OR REMOTE TERMINAL)

1. Depress CNTRL + T to terminate RECORD mode and place Recorder in STANDBY.

NOTE: The remote terminal will not receive any indication of end of tape while transmitting data to distant Recorder.

TO CORRECT TAPE WHILE RECORDING (FROM ASSOCIATED OR REMOTE TERMINAL)

1. Depress CNTRL + H to backspace tape one character at a time until first character of word that error occured in is reached.

   The Terminal character indicator also backspaces to provide an exact indication of character position.

2. Record the complete word that error occured in, if the corrected word takes up more spaces, it may be necessary to re-record all subsequent data on that line or on the remaining lines.

   Tape may be erased by over-typing, or depressing the FS (File Separator) button, while in RECORD mode.

PLAYBACK OF RECORDED DATA (FROM ASSOCIATED OR REMOTE TERMINAL)

Depress CNTRL + Q to place Recorder in PLAY mode.

Approximately 15 seconds will elapse following this operation until first character on tape is read.

TERMINATION OF PLAY MODE

Termination of PLAY mode only occurs if: CNTRL + S or CNTRL + D has been previously recorded on tape; when end-of-tape leader is encountered, or STANDBY button on Recorder is manually depressed.

TROUBLE REPORTING PROCEDURES

If the Recorder is not functioning properly check the following: -

1. The electrical connections.
2. POWER button has been turned ON.
3. Cassette is correctly inserted and TOUCH COVER is properly latched.
4. FILE PROTECTION TAB has not been removed from cassette, if recording data.
5. Ensure that LOCAL/LINE/LNP switch is in the correct position.
6. Check the following switches to ensure they are in their correct positions: -

   RATE
   RECORD
   CODE
   DUPLEX
   DELAY

7. If Recorder is being operated remotely, check remote terminal to ensure that it is functioning properly, and that correct control function codes are being used.

If the problem is still encountered following the above check procedure, report the trouble to the Telephone Company Repair number shown on the Recorder. Information should be passed in the order given below: -

1. Type of Service (VUcom I MAGNETIC TAPE CASSETTE RECORDER).
2. Circuit Number (indicated on the equipment).
3. Company name, contact name, address and telephone number.
4. Trouble encountered.
5. Name of party reporting trouble.

VUcom I

NON-IMPACT PRINTER

METHOD OF OPERATION

DESCRIPTION OF EQUIPMENT

POWER	ILLUMINATED PUSHBUTTON	The POWER button is non-locking. When depressed, illuminates, and provides power to the Printer.
CARR RETURN	PUSHBUTTON	This is a non-locking button. When depressed the Printer carriage returns to the left margin of the paper.
LINE FEED	PUSHBUTTON	This is a non-locking button. When depressed, the paper advances one or two lines, depending on the position of the SPACE button.
FEED	PUSHBUTTON	This is a non-locking button. The paper advances continuously while the FEED button is held depressed.
SPACE	SWITCH	This is a 2-position switch for selecting single or double line spacing.
CIRCUIT BREAKER	RED PUSHBUTTON	The circuit breaker is located on the back of the unit. If the POWER button does not illuminate this button should be depressed and the POWER tried again.

TRANSMISSION OF DATA TO PRINTER

Data may be transmitted to the Printer in the ON-LINE MODE or in the PRINT MODE.

PRINTER ON-LINE MODE

Page copy is required while data is being transmitted or received by the Display Terminal. Proceed as follows:

1. Verify if the POWER switch on the Printer is illuminated (POWER switch must be "ON" for terminal to operate).
2. Observe that the PRTR BSY lamp on the Display Terminal is extinguished.
3. Depress the PRINTER ON-LINE/PRINTER REQUEST button on the Display Terminal, the button illuminates.
4. The PRTR BSY and PRTR ACT indicators illuminate.
5. The Printer is now on-line and prints all data transmitted or received, that is displayed on the Terminal Display screen.
6. When the Printer is no longer required on-line, depress PRINTER REQUEST/PRINTER ON-LINE button on the Display Terminal, button extinguishes.

PRINT MODE

Page copy is required after data has been transmitted or received by the Display Terminal. Proceed as follows:

The PRINT key cannot be activated while data is in the process of being transmitted or received.

1. Observe that the PRTR BSY lamp on the Display Terminal is extinguished.
2. Depress the blue PRINT key on the Terminal. The cursor automatically resets and "dumps" all data appearing on the display screen.
3. The PRTR ACT and PRTR BSY lamps, on the Terminal illuminate while data is being transferred to the Printer.

PAPER LOADING PROCEDURES

Use the following procedures to install paper in the Non-Impact Printer

1. Lift up paper cover.

2. Remove paper spindle by lifting straight up.

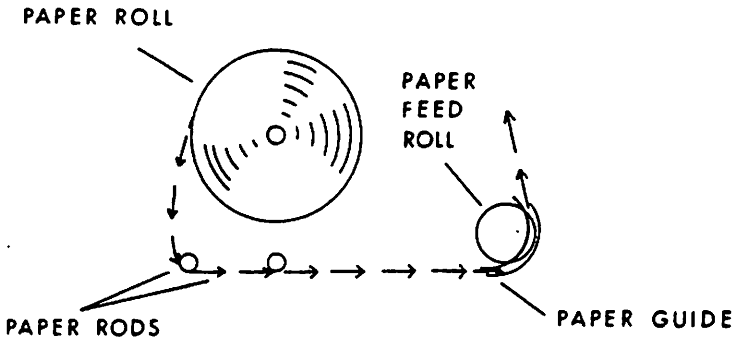
3. Remove old paper core and install new paper roll on spindle.

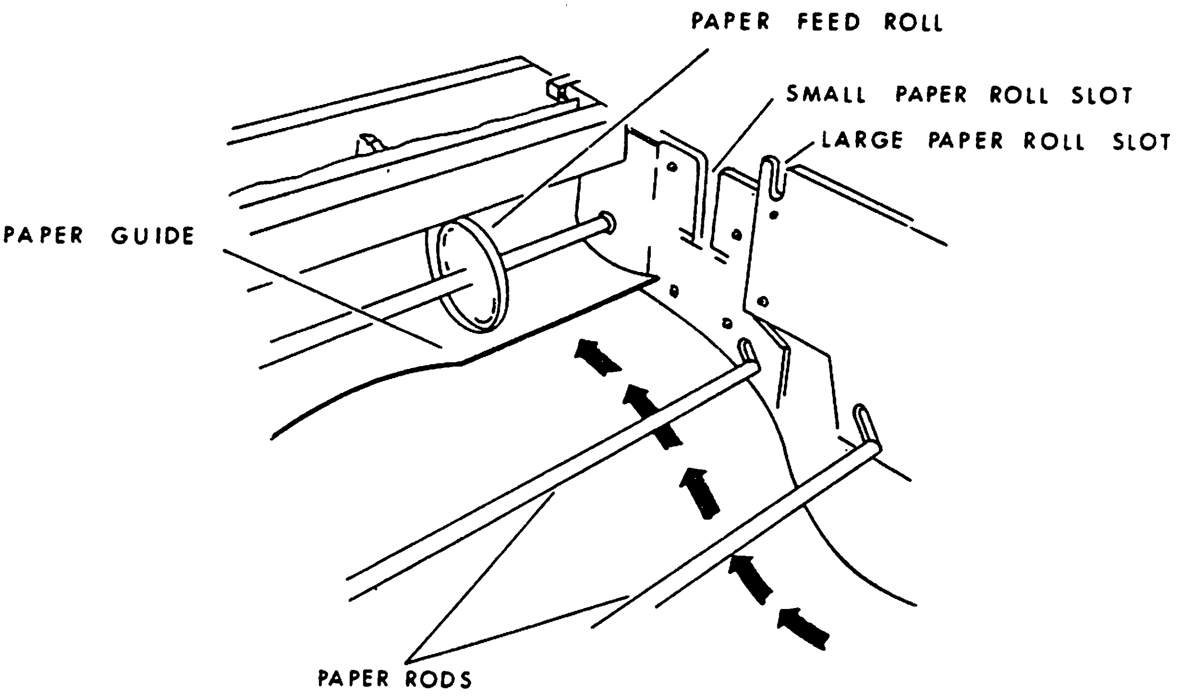
4. Replace spindle and paper in printer.

5. Thread paper around paper rod and between paper guides.

6. Feed paper through printer by turning paper feed roll by hand.

7. Replace paper cover.





TROUBLE REPORTING PROCEDURES

If the Printer is not functioning properly, check the following:

1. The electrical connections.
2. Observe that the POWER button is turned ON.
3. If POWER button does not illuminate, depress the red CIRCUIT BREAKER at the back of the Printer.
4. Verify that the Terminal is being correctly operated.
5. The paper is inserted and aligned properly.

If the problem is still being encountered following the above check procedure, report of the trouble to the Telephone Company Repair number shown on the Printer.

Information should be passed in the order given below.

1. Type of Service (VUcom I Non-Impact Printer).
2. Circuit number (indicated on the equipment).
3. Company name, contact name, address and telephone number.
4. Trouble encountered.
5. Name of party reporting trouble.

VUcom I

IMPACT PRINTER

METHOD OF OPERATION

DESCRIPTION OF EQUIPMENT

LOCAL		This button does not function with VUcom I service.
STANDBY	ILLUMINATED PUSHBUTTON	This button should be illuminated when the Printer has not been activated by the Display Terminal.
ON-LINE	ILLUMINATED PUSHBUTTON	This button illuminates when the motor is on and the Printer has been activated by the Display Terminal.
READY	ILLUMINATED PUSHBUTTON	Illuminates when the dataset is ready to receive data. This button does not illuminate if a low paper condition exists. Extinguishes on receipt of a "BREAK" signal.
INTERRUPT	ILLUMINATED PUSHBUTTON	When a "BREAK" signal is received data transmission is interrupted and this lamp illuminates. The INTERRUPT button should be restored before data is transmitted to the Printer.
ALARM	ILLUMINATED PUSHBUTTON	When an alarm condition occurs, e.g. low paper or paper shield up, etc., the ALARM lamp illuminates; an audible alarm is heard momentarily; STANDBY lamp illuminates and Motor turns off. Alarm condition should be corrected immediately.
HERE IS		This button does not function with VUcom I Service.
PRINT POSITION INDICATOR (PPI)	DIGITAL DISPLAY	Indicates the character position reached on the line.

INHIBIT	SWITCH	This is a 3-position switch. The Printer functions only when the INHIBIT switch is placed in the NORM (Normal) position.
RATE SWITCH		This is a 3-position switch that determines the BAUD RATE of the Printer. Position "10" represents 110 baud. Position "15" represents 150 baud. Position "30" represents 300 baud. THE PRINTER BAUD RATE MUST BE COMPATIBLE WITH THE ASSOCIATED TERMINAL.
LINE SPACE	SWITCH	This is a 2-position switch to select single or double line spacing.
POWER	SWITCH	The black 2-position POWER switch is located on the back of the unit and is used to control the main power supply.

The keyboard, and all other switches not mentioned in the "DESCRIPTION OF EQUIPMENT" do not function.

TRANSMISSION OF DATA TO PRINTER

Data may be transmitted to Printer in the ON LINE Mode or in the BLOCK TRANSFER.

If Page copy is required while data is being transmitted or received by the Display Terminal, proceed as follows:

PRINTER ON-LINE MODE

1. Verify if the POWER SWITCH (located at rear right side of the Printer) is in ON position. POWER SWITCH must be ON for Terminal to operate.
2. STANDBY button lamp is illuminated.
3. Determine the baud rate at which transmission will take place.
4. Make sure that the RATE switch on the Printer is set at the correct BAUD RATE.
5. Observe that the PRTR BSY lamp on the Display Terminal is extinguished.
6. Depress PRINTER ON-LINE/PRINTER REQUEST button located on the Display Terminal, button illuminates.
7. The PRTR BSY and PRTR ACT lamps located on the Display Terminal illuminate.
8. Observe that the ON-LINE and READY buttons located on the Printer are illuminated, STANDBY button is extinguished.
9. If the INTERRUPT button is illuminated manually depress button, lamp extinguishes.
10. The Printer is now on-line and prints all data transmitted or received that is displayed on the Terminal Display Screen.
11. When the Printer is no longer required on-line, depress PRINTER ON-LINE/ PRINTER REQUEST button located on the Display Terminal, button extinguishes
12. The STANDBY button on the Printer illuminates.

BLOCK TRANSFER OF DATA

BLOCK MODE (optional feature) is required to perform a BLOCK TRANSFER OF DATA.

The BLOCK TRANSFER OF DATA is possible only if the TOTAL LINE LENGTH does not exceed 78 CHARACTERS.

At the end of each line CNTRL + RETURN and CNTRL + LINE FEED codes must be inserted. At the end of the message insert CNTRL + EOT before transferring data to the Printer, otherwise the Printer will not recognize the end of line or the end of message transmission.

INSERTING CONTROL CODES

When a Page Copy is required after data has been prepared on the Display Screen or after data has been received by the Display Terminal, proceed as follows:

ON DISPLAY TERMINAL

1. Depress BLOCK MODE and EDIT buttons to locking position.
2. Depress PAGE MODE/SCROLL DISABLE, button illuminates.
3. Depress RESET key, the CURSOR appears at the top left hand side of the screen.
4. Depress "←" key twice. The CURSOR now appears at the 79th character position at the bottom of the screen.
5. Depress "↓" key once. The CURSOR now appears at the 79th character position on the top line.
6. Depress CNTRL + RETURN and CNTRL + LINE FEED. A flashing "M" & "J" appear on the screen, this indicates that the control functions have been inserted in the message.
7. Depress "↓" once and "←" twice. The CURSOR now appears on the 2nd line at the 79th character position.
8. Repeat steps 6 and 7 until the last line of displayed data is reached.
9. When the 79th character of the last data line is reached, depress CNTRL + EOT. A flashing "D" will appear on the screen to indicate that an End of Transmission code has been inserted.
10. Depress RESET key to restore the CURSOR to home location (top left hand corner of screen).
11. The message is now ready to be transmitted to the Printer.

TRANSMISSION OF DATA TO PRINTER

BLOCK TRANSFER OF DATA

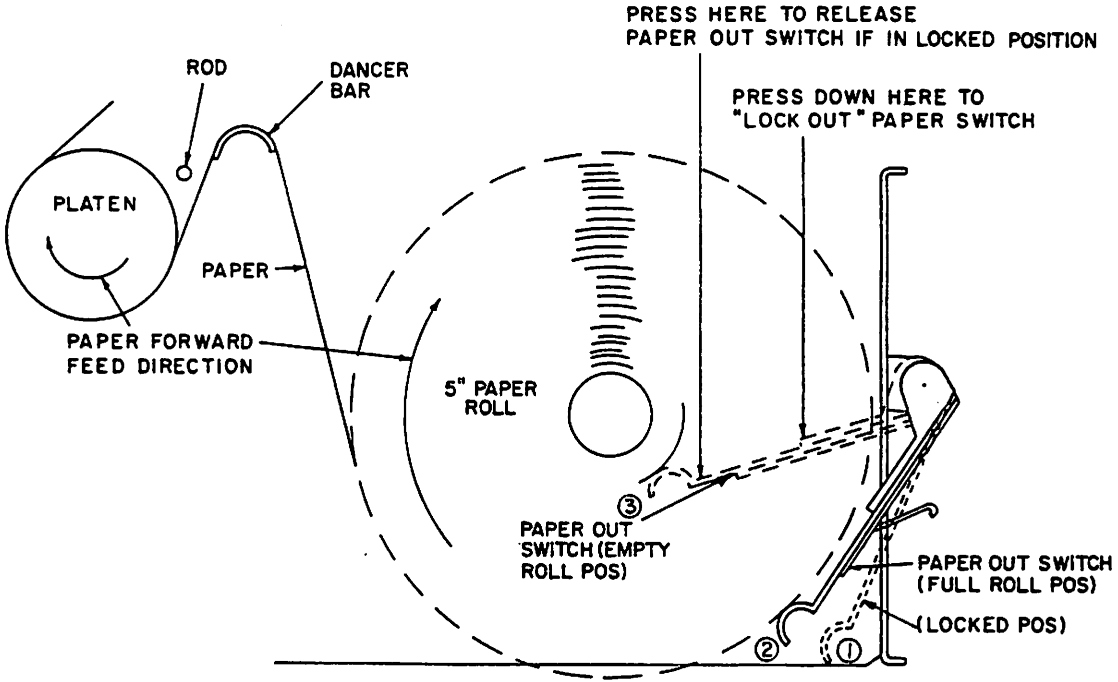
1. Verify if the POWER SWITCH located at rear right side of the Printer is in ON position.
2. STANDBY button lamp is illuminated.
3. Depress the BLOCK MODE button to release it from the locking position.
4. Observe that the PAGE MODE/SCROLL DISABLE button is illuminated.
5. Observe that the PRTR BSY lamp is extinguished.
6. Depress PRINTER ON-LINE/PRINTER REQUEST, button illuminates.
7. PRTR BSY and PRTR ACT lamps are illuminated.
8. Observe that the ON-LINE and READY buttons on the Printer are illuminated, STANDBY button is extinguished.
9. Depress RETURN and LINE FEED to position the Printer to the beginning of a new line.
10. Depress BLOCK MODE button to locking position.
11. Depress RESET key to return the CURSOR to the home location (top left hand corner).
12. If transmitting to Printer off-line the LOCAL button must be illuminated.
13. Depress STX key.
14. The CURSOR moves rapidly across the screen as data is transferred to the Printer.
15. At the end of transmission depress the PRINTER ON-LINE/PRINTER REQUEST button, lamp extinguishes.

NOTE: If transmitting to Printer ON-LINE, the LOCAL button must be extinguished, and the RATE SWITCH on the Printer set at the correct BAUD RATE.

CHANGING THE PAPER

Check the supply of paper in the Terminal frequently to avoid having it run out in the middle of a message. The approach of the end of a roll is indicated by a low paper alarm heard momentarily; the alarm lamp lights and the motor turns off. Replenish with a new supply of paper as soon as feasible.

To insert a new supply of paper, proceed as follows:


PRESS HERE TO RELEASE PAPER OUT SWITCH IF IN LOCKED POSITION
PRESS DOWN HERE TO "LOCK OUT" PAPER SWITCH
ROD
DANCER BAR
PLATEN
PAPER
PAPER FORWARD FEED DIRECTION
5" PAPER ROLL
③ PAPER OUT SWITCH (EMPTY ROLL POS)
PAPER OUT SWITCH (FULL ROLL POS)
(LOCKED POS)
②
①

① PAPER OUT SWITCH IN LOCKED POSITION - DEFEATS ALARM - ENABLES OPERATION
② PAPER OUT SWITCH IN FULL ROLL RANGE - ENABLES OPERATION
③ PAPER OUT SWITCH IN LOW PAPER POSITION

FRICTION FEED

1. Press the cover release latches and raise the cover.
2. Pull the paper release lever forward, and pull the paper out from under the platen.
3. Lift the used roll out of the machine.
4. Remove the spindle from the core of the used roll, and insert it in the new roll.
5. Replace the spindle in the spindle grooves with the paper feeding from underneath the roll forward.
6. Feed the paper over the dancer bar and down under the platen; push back the paper release lever.
7. Push the platen knob in and rotate to advance the paper.
8. To align the paper, pull the paper release lever forward and align the left edge of the paper with the coloured line on the shield.
9. Push back the paper release lever.
10. Close the cover making sure the paper feeds out through the top of the cover between the cover and the paper shield.
11. Check paper feed by operating LF.

SPROCKET FEED

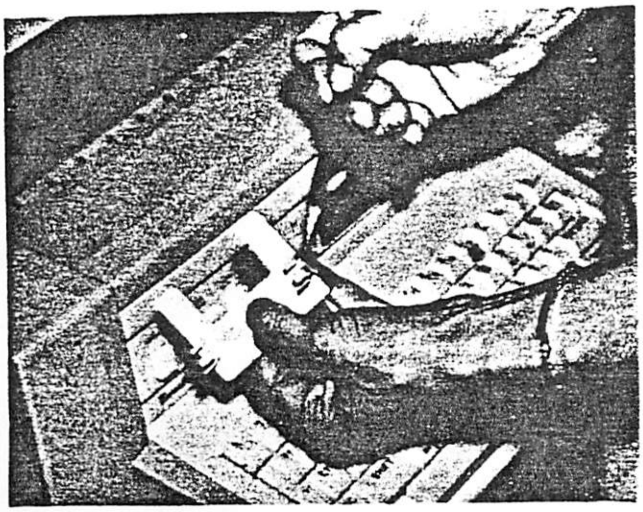
1. Push the platen knob in and rotate to remove the paper from under the platen.
2. Place the new forms at the back of the Printer or on the shelf in the kneewell of the desk; feed the paper through the rear of the machine, up over the dancer bar and down under the platen.
3. Push the platen knob in and rotate to advance the paper aligning the paper holes with the sprocket pins; turn the paper up to the first line of the form.
4. Check the paper feed by operating LF.

ANTI-CURL DEVICE

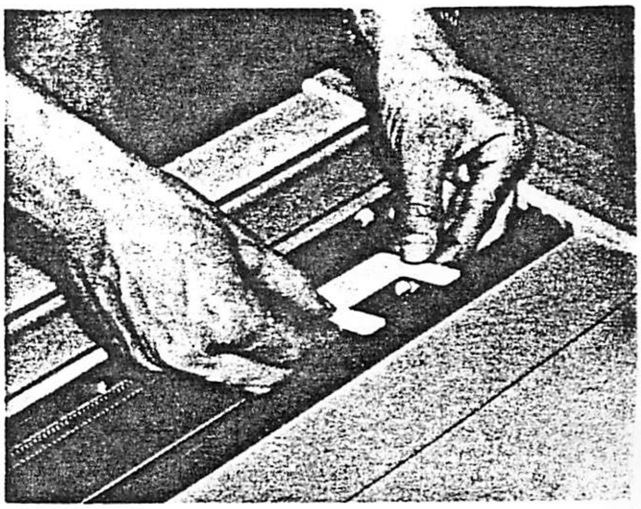
The one-piece plastic Anti-Curl Device is designed to fit on the VUcom I Impact Printer to prevent paper from curling around the rear of the platen. There are two mounting tabs (see below) on the device which fit over the horizontal pin feed rod located at the rear of the platen. With the Anti-Curl device in place, paper will advance from the Printer over the top of the device and clear of the platen. The device does not have to be removed when paper is changed in the Printer.

Instructions for installing the Anti-Curl Device are as follows:

1. Raise paper shield on Printer.
2. Position device in hand with the two flat legs toward rear of Printer (see below) and the two mounting tabs downward.
3. Locate approximate position on the horizontal pin feed rod which would correspond to the mid-point of the paper.
4. Firmly press the two tabs over the pin feed rod at this position.
5. Lower paper shield.



Mounting Tabs



Installing Anti-Curl Device

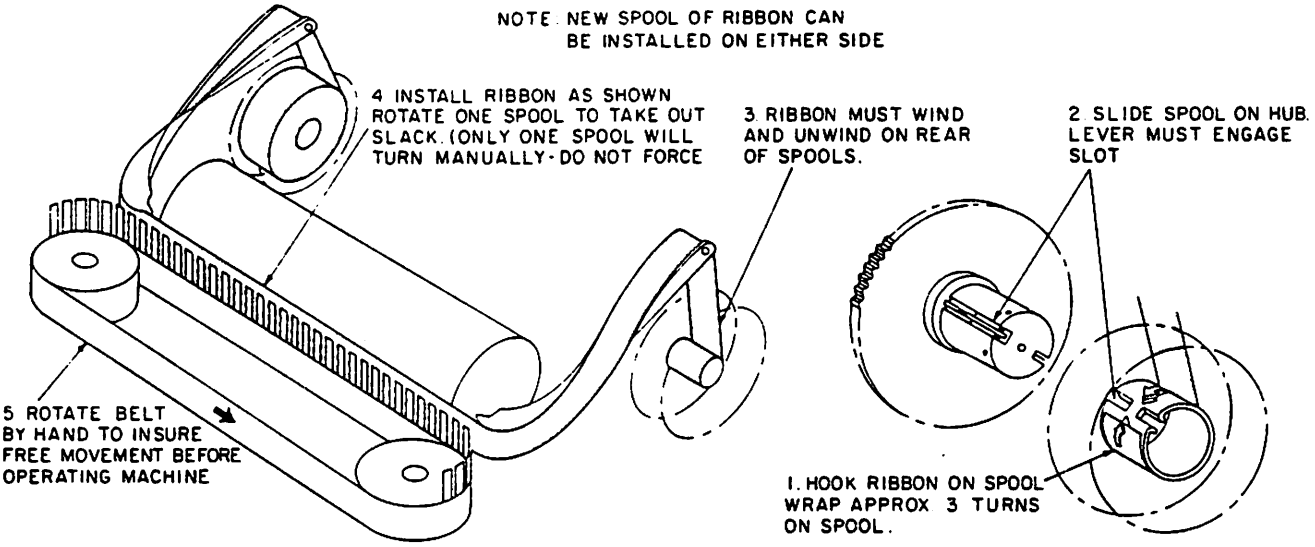
CHANGING THE RIBBON

Check the condition of the ribbon frequently so that it can be replaced as soon as it becomes worn. Use the recommended type of ribbon which is similar to a typewriter ribbon but is made especially for VUcom I Impact Printer use.

To change the ribbon, proceed as follows:

1. Press the cover release latches and raise the cover.
2. Raise the plastic paper shield and remove both ribbon spools releasing the ribbon from the ribbon guides.
3. Place the new spools on the spool shafts making sure that the levers have engaged the hub slots and the ribbon feeds from the outside of the spools.
4. Place the ribbon around the ribbon guides.
5. Take up the slack by turning the free spool. Only one spool will turn manually - do not force.
6. Rotate belt by hand to insure free movement before operating machine.
7. Close the cover making sure the paper feeds out through the top of the cover between the cover and the paper shield.

RIBBON INSTALLATION DIAGRAM



NOTE. NEW SPOOL OF RIBBON CAN
BE INSTALLED ON EITHER SIDE

4 INSTALL RIBBON AS SHOWN
ROTATE ONE SPOOL TO TAKE OUT
SLACK. (ONLY ONE SPOOL WILL
TURN MANUALLY - DO NOT FORCE

3. RIBBON MUST WIND
AND UNWIND ON REAR
OF SPOOLS.

2. SLIDE SPOOL ON HUB.
LEVER MUST ENGAGE
SLOT

5 ROTATE BELT
BY HAND TO INSURE
FREE MOVEMENT BEFORE
OPERATING MACHINE

1. HOOK RIBBON ON SPOOL
WRAP APPROX 3 TURNS
ON SPOOL.

TROUBLE REPORTING PROCEDURES

If the Printer is not functioning properly, check the following:

1. The electrical connections.
2. Ensure POWER button is turned ON.
3. Check the BAUD RATE switch for compatibility with the associated terminal.
4. The INTERRUPT button is extinguished.
5. The paper shield is not up.
6. Paper supply has not run too low.
7. Ensure the associated Display Terminal is accessing the Printer correctly.

If problem is still being encountered following the above check procedure, report the trouble to the Telephone Company Repair number shown on the Printer.

Information should be passed in the order given below.

1. Type of service (VUcom I Impact Printer).
2. Circuit number (indicated on the Printer).
3. Company name, contact name, address and telephone number.
4. Trouble encountered.
5. Name of party reporting trouble.